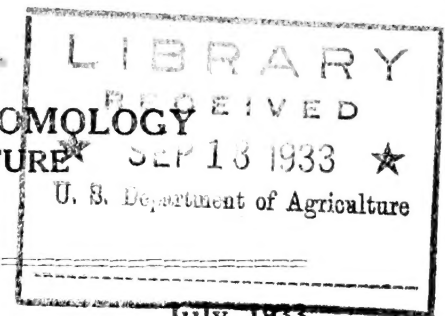


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BEE CULTURE

Pollen counts for honeys from different sources show great variation.--"Various methods have been tested in an attempt to reduce the great variation in the pollen count for one gram of honey," reports Alice M. Mayo, Somerset, Md. "Instead of using a 1-gram sample, it is believed that the error in weight is reduced to a minimum if a small sample of well-mixed honey is weighed to the fourth decimal and mixed with 5 c c of water, centrifuged, and decanted to 1 c c. The resulting number of grains per field is multiplied by the constant 5,555 and then divided by the exact weight of the sample taken. This gives the number of grains per gram. While the results by this method vary somewhat, the variation is much less than that obtained by any other method. The data obtained by these pollen counts have proved interesting; for instance: The count for tupelo honey from Louisiana is about 7,000, whereas that for tupelo honey from Florida is about 56,000; sweet clover and alfalfa honey from Montana has a count of about 26,000, whereas sweet clover and alfalfa honey from Wyoming has a count of about 56,000; sumac honey has a count of only about 4,000; and goldenrod and peppervine honeys from Louisiana both have high counts, the former being about 180,000 and the latter about 155,000."

Package bee industry holds its own.--E. L. Sechrist, Davis, Calif., reports that notwithstanding the general depression, "the volume of package bee shipments has held up well, although the prices have fallen to the lowest levels in the history of package bee shipping." The total number of packages shipped in 1932 was 28,417; in 1933, 29,276. The average price per package in 1932 was \$1.79; in 1933, \$1.48. "The price decline started in 1922 and has continued ever since, the average price in 1933 being one third that in 1921 and about half that of 1926. The price difficulty appears to be owing more to competition between shippers and their inability to get together than to the unwillingness of the honey producers to pay higher prices."

FRUIT AND SHADE TREE INSECTS

Life history of the pecan phylloxera.--Howard Baker, of the Shreveport, La., laboratory, has been giving special attention to the

life history of Phylloxera devastatrix Perg., a subject about which much uncertainty has existed. He observed that on emergence from the galls the winged forms deposited large numbers of eggs. The forms hatching from these eggs migrated downward toward the trunk and apparently congregated beneath rough bark, where they remained and turned reddish-brown in color. The bodies of most of them contained a single egg each. These forms apparently remain in this condition until development is resumed when the pecan buds open the next spring.

Pecan nut case bearer controlled by nicotine combinations.--G.F. Moznette, in charge of the Albany, Ga., nut-insect laboratory, reports a high degree of control of Acrobasis caryae Grote from applications of nicotine sulphate in various combinations. The results are summarized as follows:

<u>Treatment</u>	<u>Infested nut clusters</u>
	<u>Percent</u>
Nicotine sulphate 1-1,000 with Bordeaux mixture 3-4-50.....	0.46
Nicotine sulphate 1-1,000 with white oil emulsion (Volck Junior) 3/4 percent.....	0.42
White oil emulsion (Volck Junior) 3/4 percent.....	3.33
White oil emulsion (Volck Junior) 1 1/2 percent..	2.29
Nicotine sulphate 1-1,000 with white oil emul- sion (Summer-emulsion light) 3/4 percent.....	0.50
Nicotine sulphate 1-1,000 with white oil emul- sion (Verdol) 3/4 percent.....	0.31
White oil emulsion (Verdol) 1 1/2 percent.....	1.55
Nicotine sulphate 1-1,000 with fish oil 1/4 percent.....	0.52
Checks (average of 4 plats).....	5.31

Rearing and utilization of Trichogramma for control of pecan nut case bearer.--With the use of recently developed technique (described in the Monthly Letter, January 1933) the production of Trichogramma has reached a high stage of efficiency. Herbert Spencer and Luther Brown, who are conducting this work at Albany, Ga., report as follows on their laboratory production of eggs of the Angoumois grain moth (Sitotroga cerealella Oliv.) for this purpose during 1933, as compared with previous years. In 1931, a total of 24,614,500 eggs, with the peak of production (10,480,000) in June; in 1932, a total of 20,523,000 eggs, with the peak

of production (12,257,000) in July; in 1933 a total of 104,710,000, with the greatest number (25,516,000) in March, followed closely by April and May. Their report as to the results of the liberation of these parasites, however, is much less encouraging. After a discussion of factors that might have affected the results, these workers have reached the conclusion "that the data obtained, while showing some experimental variation, are reliable and indicate that no control was obtained this season on the nut case bearer with Trichogramma."

Control of pecan nut case bearer by the use of lead arsenate.--C. B. Nickels, Brownwood, Tex., has submitted a preliminary report indicating the possibility of controlling Acrobasis caryae by the use of lead arsenate. Two applications were made of lead arsenate, 3 pounds to 50 gallons, against the first brood of this insect in each of three experiments. No foliage injury occurred in these tests, which were conducted under semiarid conditions. Preliminary counts showed that the percentages of clusters infested in the three tests were as follows: Sprayed, 1.45, 0.55, and 7.40; unsprayed, 33.73, 13.98, and 41.35.

JAPANESE BEETLE AND ASIATIC BEETLE RESEARCH

Dosage of lead arsenate for control of Jap beetle larvae in soil.--M. R. Osburn, Moorestown, N. J., reports that "The larval survey of the turf treatments with lead arsenate, applied in 1929, showed about 50 percent reduction in those receiving 10 pounds to 1,000 square feet, 86 percent reduction in those receiving 20 pounds to 1,000 square feet, and 96 percent or greater with the higher concentrations (30 pounds or more). In the top-dressing plots treated in 1932 the application of 5 pounds to 1,000 square feet reduced the light infestation 95 percent."

Present status of the introduced parasite *Tiphia vernalis*.---Summarizing the results of work on the spring emergence of the *Tiphia* parasite of the Jap beetle, G. W. Balock, Moorestown, reports that of the colonies 2 years old or older, 19 out of 29 were recovered. The natural parasitization in the field ranged from 7 to 14 percent; 6,918 females were taken in local collections; 65 colonies were established with females collected locally, and 41 colonies were established from foreign importations, making the season's total 106 colonies; and 10,237 living females were imported, the mortality being 17.4 percent.

TRUCK CROP AND GARDEN INSECTS

Injury to beans by nicotine sulphate described.---Reporting on insecticidal treatments against the Mexican bean beetle (*Epilachna corrupta* Muls.), L. W. Brannon, Norfolk, Va., says, "for the first time

ever observed by the writer there is a distinct foliage injury on the plats treated with nicotine sulphate, 1 to 400, and on all arsenical and fluosilicate plats on which this material at the same rate was applied with the arsenical or fluosilicate. The injury appears as a whitening or bleaching of the green coloring matter of the leaves and appears to extend from the margin toward the center of the leaf. This injury does not appear on adjacent check plats or on the plats treated with arsenicals or fluosilicates to which nicotine sulphate had not been added. The cause of this is not known, as it did not appear on beans treated with this material earlier in the season or in former seasons."

Emergence of Mexican bean beetle in New Mexico.--J. R. Douglass, Estancia, N. Mex., reports that "There were two peaks of intensive emergence from hibernation, the first on June 19 and the second on June 23. Precipitation stimulated the beetles to emerge on those dates. The most intensive emergence occurred on June 23, when 2,534 beetles emerged in cages in the western yellow pine forest zone."

Narcissus bulb nematode survives hot-water treatment.--F. J. Spruijt, Babylon, N. Y., reports that from examination in the laboratory of "potted samples of last season's vapor heat and hot water treated bulbs * * * it seems clear that live Tylenchus may pass through a vapor heat treatment of 113° F. for 5 hours. A similar result was obtained in last September examinations. It came as a surprise to find a survival of about 70 specimens in the sample of the hot water treatment of 115° for 5 hours. In the September examination, the records showed numerous dead Tylenchus and the later results point to the possibility of eggs passing through as high a temperature range as given and remaining viable."

Sand wireworm has 1-year cycle.--"The 1-year life cycle for Horistonotus uhleri Horn has now been definitely established," according to E. W. Howe, Fairfax, S. C. "A total of 25 records of completion of the larval stage have been obtained and practically all the remainder of surviving larvae (of reared material) have reached a size where pupation this season can be safely anticipated."

Rotenone repels but does not kill larvae of celery leaf tier.--C. B. Wisecup, Sanford, Fla., reports: "Previous experiments with rotenone products as a control for the southern armyworm (Prodenia eridania Cram.) indicated that no appreciable kill could be obtained but there appeared to be a decided repellent effect. One experiment was conducted in June to obtain further information on this point. Recently hatched larvae of the celery leaf tier (Phlyctaenia rubigalis Guen.) were used and a proprietary cube extract 1 to 200, derris extract 1 to 200, and derris extract 1 to 600 were tested against lead arsenate 2 pounds per 100 gallons of water. Almost no kill was obtained except with the lead arsenate, which was 100 percent effective. Approximately 50 percent of the larvae left the foliage treated with the rotenone products and the

feeding of those remaining was greatly reduced. Previous experiments had shown that the action was repellent, inasmuch as the larvae fed normally when placed on untreated foliage."

New method of counting beet leafhoppers.--W. C. Cook, Modesto, Calif., reports that "A new apparatus to be used in measuring populations of Eutettix tenellus Bak. on varieties of sugar beets was built and tested. This was essentially a manure fork, with tines 13 inches long and 1 inch wide, placed 1 inch apart. The last inch of tine is tapered to a point and turned slightly upward. The fork is covered with fly spray and shoved under the plants to be sampled. Then the plants above and surrounding the fork are sprayed and the insects falling on the first 12 inches of tine are counted. The counting area was one half square foot. * * * It is believed that, although this method is time-consuming, it gives a very accurate count."

Derris dust effective against tobacco flea beetle.--F. S. Chamberlin, Quincy, Fla., who has been testing the comparative toxicity of three fluorine compounds and derris against Epitrix parvula Fab. under laboratory conditions, reports that "The outstanding feature of the results is the perfect kill obtained with the diluted derris dust, a mixture of derris (0.4 percent rotenone) and tobacco dust (1 to 10). The poison acted either through contact or the 'clean-up method' as no feeding on foliage occurred. The kill resulting from derris took place in the first 24 hours, whereas the fluorine compounds continued to kill over a 48-hour period."

Safety in arsenical treatments for cabbage insects.--In a summary of the season's studies of arsenical residue on cabbage, W. J. Reid, Jr., Charleston, S. C., says, "from the results of the first season's studies, so far as the arsenic residue is concerned, arsenical applications as used in the tests (4 pounds of lead arsenate per acre per application) may be safely made on cabbage until 20 days before harvest, provided the marketed heads have been stripped down to contain not more than four loose outer leaves. Stripping to these four loose outer, or wrapper, leaves is the usual commercial practice in the Charleston, S. C., area."

FOREST INSECTS

Egg parasite aids in controlling pine tip moth.--L. G. Baumhofer, Coeur d'Alene, Idaho, reports as follows on the importance of Trichogramma minutum Riley: "This egg parasite destroyed 33 percent of the eggs of Rhyacionia neomexicana Dyar, attacking the host eggs from the last of April and throughout May. The percentage of parasitization is based on 420 eggs collected in the field during the egg-laying period. Adult parasites emerged from May 24 to June 5."

Saving the parasites in Coeur d'Alene forest.--Reporting on natural control of the mountain pine beetle (Dendroctonus monticolae Hopk.),

W. E. Bedard, Coeur d'Alene, Idaho, says: "The examination of 127 infested white pines on the Coeur d'Alene control project showed that there was a concentration of parasites in the trees attacked in June and early July of the previous year (1932). The parasitization in these trees averaged approximately 60 percent. Windfalls carrying heavy parasitization can be readily recognized by the presence of numerous cocoons of Coeloides dendroctoni Cush. under the bark. Standing trees containing parasites can be recognized by the presence of a few of these cocoons at the base of the tree, which indicates a higher percentage of parasitization farther up the tree. Thus, by training spotters to look for these cocoons heavily parasitized trees can be left and the parasites saved."

CEREAL AND FORAGE INSECTS

Swarming of red harvester ant in southern Texas.---"The first flight of sexual forms of Pogonomyrmex barbatus F. Smith was observed", by E. V. Walter, San Antonio, Tex., "on May 30 this year, approximately a month earlier than normal. Other flights were observed June 14, 15, and 19. * * * One flight was observed from the beginning at Comfort, Tex., on June 19 between 4:30 and 5 p. m. The sexual forms were observed coming from the entrance of the nest facing the wind and apparently testing the air with their antennae. After a few moments they returned to the nest in a somewhat excited manner. At about 5 o'clock the sexual forms took wing from nearly all nests in the vicinity, of which there were approximately 50, and flew to a point about 40 rods distant. The flight was observed until 6 p. m. The numbers in the air at that time appeared to be about the same as at any time during the previous hour. The number of males was about 4 times the number of females. Counts made in other swarms indicate that this is the approximate proportion found."

Emergence of corn earworm extends over long period.---Geo. W. Barber, Savannah, Ga., reports that "Adults of Heliothis obsoleta Fab. have emerged from hibernation throughout the month of June this year as heretofore. The earliest emergence from hibernation this year was on March 25, so that up to the present time emergence has occupied a 3-months' period. In the experiments, up to the 26th of this month, emergence of moths was recorded on 1 day in March, on 16 days in April, on 29 days in May, and on 22 days in June."

Light lubricating oil as possible substitute for water and molasses in grasshopper baits.---According to J. R. Parker, Bozeman, Mont., "R. L. Shotwell, who is working in the vicinity of Dickinson, N. Dak., reports good results with grasshopper baits containing cheap, light lubricating oil as a substitute for water and molasses in ordinary baits. Such baits compared with the best standard baits have consistently stood near the top in plot and cage experiments where kills made only after several hours of feeding were the basis of comparison. In larger field

tests the oil baits remained effective for several days and gave larger kills on the second, third, and fourth days than did baits containing water. Sodium fluosilicate continues to give high and quick kills both in plot and field tests."

Consolidation of Monroe Toledo, and Sandusky laboratories.--Effective July 1, 1933, the three laboratories engaged in research on the European corn borer, located at Monroe, Mich., Toledo, Ohio, and Sandusky, Ohio, were consolidated at a new address, 1920 Parkwood Avenue, Toledo. The garage and work-shop quarters were moved to 2021 Adams Street, Toledo, and will be occupied jointly with the U. S. Bureau of Agricultural Engineering.

COTTON INSECTS

Cotton flea hopper populations on main host plants.--T. C. Barber, Brownsville, Tex., reports that the total population of Psallius seriatus Reut., on main host plants, on the basis of 100 sweeps per plant on June 28 and on June 30 were as follows: Horsemint, 1,890; croton, 1,300; Gaura coccinea, 330; cotton, 13, "the number of hoppers upon the mint plant exceeding the hoppers on the cotton plant by 150 to 1; the population on croton outnumbering the cotton population by 100 to 1; and the population on Gaura coccinea exceeding the population on cotton by about 25 to 1."

At Port Lavaca, Tex., according to K. P. Ewing, the weekly averages per 100 sweeps were:

	<u>Cotton</u>	<u>Horsemint</u>	<u>Croton</u>	<u>Miscellaneous hosts</u>
May 1 - 6.....	----	-----	----	9.0
May 15 - 20.....	67.1	-----	-----	3.7
May 22 - 27.....	69.7	-----	-----	0
May 29 - June 3..	217.3	2,249.3	-----	0
June 5 - 10.....	252.8	930.0	1,722.0	0
June 12 - 17.....	187.4	962.0	1,657.0	0.3
June 19 - 24.....	248.0	583.7	2,287.7	9.3
June 26 - July 1..	167.7	433.0	3,623.0	4.7

Mr. Ewing also submits a table showing that daily emergence of flea-hopper nymphs ceased on June 8 but that, stimulated by rainfall on June 11 to 14, emergence began again on June 17 and continued through June 21. Of the various host plants concerned the greatest emergence was from Croton, with an average (for the month) per cage, or 100 plants, of 418. Averages for other hosts were as follows: Parthenium hysterophorus, 84; ragweed, 31; milkweed, 21; cotton, 15.3; bitterweed, 10; fleabane, 3; Aster exilis, 1.5; broomweed, 1; and cocklebur, 1.

Heavy survival of pink bollworms at Presidio, Tex.--F. A. Fenton and A. J. Chapman report that "The most striking and significant development in June at the pink bollworm laboratory at Presidio was the continuation of unusually heavy emergence of moths from long-cycle, or over-

wintering, larvae. During this month 200 moths emerged, or approximately 1.2 percent of the total number of larvae hibernating under different field conditions, as compared with 23 moths, or approximately 0.12 percent, of the total number of larvae installed for a similar test the year before. This heavy June emergence is quite significant in view of the fact that in June the cotton plants in the Presidio district were fruiting. The total survival as of June 30 for this experiment was 9.33 percent, as compared with 3.52 percent for the same test last year. This unusually heavy survival was predicted from the winter and early spring examination of infested cotton bolls for similar treatments."

INSECTS AFFECTING MAN AND ANIMALS

Correction.--In the June 1933 Monthly Letter, p. 8, lines 14 and 15 should read: Mosquito eggs in moss and rotten wood are submerged only at river's flood stage.

Sodium sulphide solutions in blowfly baits increase attractiveness.
--E. W. Laake, Dallas, Tex., reports on tests with sodium sulphide solutions, ranging from 1 to 5 percent in concentration, used with fresh meat for blowfly baits, the purpose of the experiment being to find a solution that would increase the attractiveness of the bait and also prevent the breeding of flies in the bait. He says, "These solutions in concentrations greater than 2 percent are highly alkaline and inhibit bacterial action on the bait for periods of from 10 to 15 days or longer. After this period of inactivity, during which the alkalinity reduces to a point where the bait will sustain bacterial growth, an active period follows, during which the attractant properties are equal or greater and of longer duration than those of the baits containing solutions of lower concentrations. The attractiveness of the baits containing the higher concentrations of sodium sulphide, when these baits become active, apparently is enhanced considerably for Cochiyomyia macellaria Fab., as compared to that of baits containing sodium sulphide in lower concentrations. Very few larvae develop in meat baits containing sodium sulphide solutions of 3 percent and greater, whereas in baits containing lower concentrations larvae develop freely and consume the meat rapidly."

Flight range of two Aedes mosquitoes.--H. H. Stage, Portland, Oreg., reports the recovery at a distance of several hundred feet of an adult Aedes vexans Meig. stained on June 19; also on June 30 of one that had flown 3 miles. He states further that "On June 21 it was estimated that from 5,000,000 to 15,000,000 adults, largely A. aldrichi Dyar and Knab, were stained with a 2 percent aqueous solution of eosin as they were resting in the grass adjacent to the water from which they had emerged the day before. An hour after being stained several hundred captured with a net were examined and 37.1 percent gave positive reactions; 24 hours later 8.5 percent of those caught were found stained; 48 hours later only 4.4 percent were stained. A collection made 5 days later gave 1.7 percent stained. Twenty-four hours after staining one red-stained

individual was taken approximately one fifth mile distant from the point of staining and across a stretch of the Oregon Slough. Three days after staining one individual was captured at the Rankin Airport, fully a mile away."

New method of collecting eggs of throat botfly.--E. F. Knipling, Ames, Iowa, reports that he "has devised a very successful method of collecting freshly deposited eggs of Gastrophilus nasalis L. From a horsehide, tanned with the fur on, strips of a size to cover the jaws of the horse were cut and laced into position in halters. On this fur, so worn by the horses, the species readily deposited their eggs, in greater abundance we think than on the living hair of the host. At chosen intervals the halters are removed and the eggs are clipped. By this very helpful method it has been possible to gain accurate knowledge of the age of larger numbers of eggs."

Army horses to be used in botfly studies.--R. W. Wells, Ames, Iowa, states that "Through the office of the Area Coordinator arrangements were made for the transfer to the Ames field laboratory of five head of horses designated by the Army for destruction. These were transported from Fort Des Moines, a distance of 37 miles, at a cartage cost to us of \$12. The horses are to be used for making life-history studies on Gastrophilus. On one horse, in which, periodically, we are introducing in the mouth large numbers of hatching larvae of G. nasalis, we plan to have a necropsy in about a week, hoping to gain some needed information on the habits of the first stage of this pest."

Widespread use of surgical maggot treatment recorded.--Wm. Robinson, Washington, D. C., reports the compilation of a card catalogue "of the names of doctors and hospitals throughout the entire country who have used the maggot method of treatment. * * * it is very interesting to find that every State, with the exception of Nevada, is represented, and that more than 900 doctors have used the maggot treatment. Some of the surgeons have been using the method for 2 or 3 years upon a considerable number of patients; and with hardly any exception they are gratified with the good results obtained. Occasionally we receive requests from people who have heard of the maggot treatment and who want to get in touch with a surgeon who can give them this treatment. We are now able to give these inquirers the names of several doctors or hospitals in their own or adjoining State whom they may consult."

STORED PRODUCT INSECTS

Notes on cured tobacco insects.--According to W. D. Reed, Richmond, Va., "Tobacco dealers and manufacturers have shown much interest in the suction light trap. Various firms have purchased traps and our records indicate that on June 30 approximately 400 traps were in operation in the bright tobacco belt. * * * The emergence of the spring

brood of the tobacco moth (Ephestia elutella Hbn.) was practically complete on June 15 in the tobacco warehouses in Richmond. The peak of the emergence of the spring brood of cigarette beetles (Lasioderma sericorne Fab.) in the Richmond, Norfolk, and Danville districts was reached about the middle of June."

Mr. Reed sailed from New York on July 14 for Europe to spend the summer and early fall studying insect conditions in the American owned and operated tobacco manipulation centers in Greece and Turkey. He will return via Paris and London to consult with tobacco interests in those cities.

Pea weevil studies in Oregon and Idaho.---A. O. Larson, Corvallis, Oreg., reports that "Peas from different market gardens have been examined immediately after they were picked. Some of the eggs undoubtedly were rubbed off as the pods were being picked but the information obtained gives an idea of the degree of infestation in peas put on the market." In 10 samples examined at different dates after June 15 the percentage of pods without eggs ranged from 0.57 to 41.5, averaging about 23.

Tom Brindley, Moscow, Idaho, reports that "Pea weevils emerged in quite large numbers, notwithstanding the severe winter. Fields in localities heavily infested the past season were found to have a moderately heavy infestation this year. The maximum number collected in these patches was, however, about eight times less than the maximum number collected in 1932."

Ephestia spp. in vineyards and fig orchards.---H. C. Donohoe, Fresno, Calif., reports that "Laboratory rearings of 42 larvae collected from soil about fig trees from 8 collections in 5 orchards during the past winter and spring yielded 39 Ephestia figulilella Greg. and 1 Nemeritis canescens Grav. A parasitization of overwinter larvae of 2.3 percent is indicated. Apparently the larvae hibernating under the bark of grapevines serve as the principal source of these parasites." As to survival of the raisin moth under grapevine bark, Mr. Donohoe says, "On June 21 and 26, 12 Thompson Seedless (Sultanina) grapevines were examined for the presence of overwintering larvae. * * * Larvae were present at the rate of 43 per acre. By comparison with the average population indicated in the examination of February 8, this amounts to a reduction in numbers, through emergence of adults and parasitism, of 95.4 percent of the overwintering population in this vineyard. Since, in most cases, available food on which adults may lay their eggs was wanting until apricots and first-crop figs began to ripen the last two weeks in June, the bulk of the moths emerging from hibernation under bark apparently failed to reproduce." In the soil about the trees in a Black Mission fig orchard, sampled on June 23 and 25, "The average infestation for 8 trees in an 8-inch band of soil about each tree was 8.5 larvae. The indicated overwintering population on the basis of all live larvae and pupae, dead larvae, parasites, and empty cocoons found in the 8 samples

was 18.5 larvae per 8-inch band. This means that 46.3 percent of the overwintering larvae are still present in the soil as live larvae and pupae and will, upon emergence, have ample opportunity to oviposit on first-crop figs and apricots. These data indicate that larvae hibernating under grapevine bark emerge before a general food supply is available. They serve, however, as the reservoir for overwintering parasites. Larvae in the soil, on the other hand, emerge later in the spring and are relatively free from parasites. Larvae hibernating in the soil must be considered as an especially effective source of moths from the overwintering brood of larvae."

Mulberries furnish food for larvae of the raisin moth.--Mr. Donohoe states that "A sample of mulberries collected from the ground on June 6 and examined June 24 yielded 48 larvae, or an average of 1,024,000 per ton of dry fruit. Mulberries begin to ripen and fall to the ground early in May and continue to produce fruit throughout June. Although not a commercial crop, a brief survey has shown that they are extensively planted about farmsteads for shade. The fruit is allowed to drop on the ground unharvested. During the period of mulberry production, prior to the middle of June, no other known food for larvae exists. The fact that moths which emerge before ripening of other fruits are able to lay their eggs on mulberries is of importance. The result is that an extra brood of adults is produced in the spring which will emerge to infest fruits in July, when the population of adults would otherwise be at a minimum."

